

# Preparing the Health Services Research Workforce

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**Objective.** To describe the ways in which investigators are trained for careers in health services research and estimate their number.

**Data Sources/Study Setting.** Sources describing health services research (HSR) training were consulted and published inventories of HSR training programs were reviewed and 124 training programs were contacted and interviewed to determine the numbers of students and the content of their HSR degree programs.

**Study Design.** Observational study.

**Data Collection.** HSR programs listed by AcademyHealth were surveyed and asked for details of enrollments; course content was captured from websites for the remaining programs.

**Principal Findings.** There are over 300 programs that train investigators in health services research in master's and doctoral programs. The number of graduates who become HSRs in any given year is unknown, but approximately 5,000 individuals graduate with skills that would allow them to function in or lead HSR projects and up to 200 fellows are annually trained as potential independent health services researchers.

**Conclusions.** The training pipeline for HSR appears to match demand because there are no apparent shortages of skilled workers in the field. There are many forces that are pressuring the field to adapt to technology demands and the increasing need for "translation" of results from research into practice.

**Key Words.** Health services research, training, supply, workforce

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Health services research (HSR) is a field of inquiry that employs professionals who seek to understand how health care is organized, financed, and contributes to the health of individuals. The field of HSR has a core of investigators who progress along a coherent HSR training track. However, the field depends on attracting analytical professionals from many fields into the study of health services. When anticipating the size and structure of the workforce in a professional, especially health professions field, it has become popular to describe the process of training or education leading to a professional career as a "pipeline." In the pipeline, students and trainees move from basic to general

education, then on to professional preparation and practical training. From there the new professionals gain initial experiences and eventually move into mature practice or employment.

This paper describes the preparation of health services researchers and provides a rough estimate of the numbers currently in training for the field. The paper is not intended to be a quantitative and rigorous estimate of the numbers of people trained in HSR but a general discussion of the training process and its scope. This paper is one of three that were commissioned to try to characterize the workforce for HSR and assess whether it is adequate to meet the nation's needs.

In HSR, the flow in the pipeline is dependent on the funds that are available for specific studies as well as the needs of policy makers for answers to specific policy questions. In this sense, the flow of professionals into and out of HSR could be described less like a pipeline and more like a "sponge" that soaks up investigators, analysts, and disseminators for issue- or project-specific tasks and then returns them to their more "normal" clinical practice or basic scientific or social inquiry activities when a question is answered or funding ends. This transience of practitioners of HSR into and out of the field makes it difficult to understand their preparation. There are, however, several principal pathways that develop health services researchers and others who support their work.

There is no consensus on what constitutes the core training requirements for health services researchers, but the great majority of doctoral programs that self-identify as HSR include the following: an introduction to the scientific method, methods for reviewing scientific literature and evidence, grounding in statistics and/or econometrics, an understanding of data management and data sources in health care delivery systems and organizations, and an applied course that develops skills in analysis and presentation of data.

A hallmark of HSR is its multi- and interdisciplinary character. Currently, in health care delivery, the emphasis on "interdisciplinary" means joining the worlds of basic and applied research to clinical practice—bringing the "bench" closer to the "bedside." This is a limited view of the way in which HSR combines different disciplines to answer important questions. The "bench" in HSR includes the management of systems, clinical decision making, and collective and individual behaviors that affect costs and outcomes.

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HSR is not a melting pot for all of social, behavioral, and medical science, but it does reflect a sense of “consilience” in that it consciously joins many separate threads of theory and practice (Wilson 1999). No core discipline or mix of disciplines is apparent in HSR. When searching for the heart of the field, “competencies” are considered rather than theories (Forrest and Martin 2009).

## WHO TRAINS HEALTH SERVICES RESEARCHERS?

There is an extensive infrastructure for training health services researchers in universities and research institutes and centers; however, there is no comprehensive guide to the field nor an index or inventory of programs that train health services researchers. The task given to the authors was to develop a rough estimate of numbers in training in HSR. To do so, we made use of publicly available listings and compilations and supplemented that with a time-limited, nonscientific telephone survey of programs. AcademyHealth, the professional organization of health services researchers, in their 2007 inventory of training programs, listed 124 graduate programs in HSR in the United States and Canada, including 45 master’s, 66 doctoral, and 26 fellowship degree programs (some programs overlapped). A 1995 Institute of Medicine (IOM) report on the field estimated an enrollment of 1,015 master’s students, 51 doctoral students, and 197 postdoctoral fellows in the field of HSR (Field, Tranquada, and Feasley 1995). Those numbers represent the “core” production for the field and are likely very low bounds of the actual number of programs and students in training, as there are other ways in which HSRs are trained.

The 124 programs listed by AcademyHealth were surveyed in spring 2007, and the number of current trainees was requested from administrators of the programs. This was a very brief telephone survey contacting a listed telephone number for each program. Surveyors asked to speak with the person most knowledgeable about the enrollment in the program. Up to three attempts were made to reach an appropriate informant. Programs were asked whether they had a master’s or doctoral program that trained HSRs, how many students were currently in each program, an open-ended question that asked where recent graduates went to work, and a scaled response question about the degree of difficulty graduates had in getting jobs in HSR. Almost 50 percent ( $n = 60$ ) of the programs responded, allowing for an estimate of the total number of enrollees and annual graduates from those programs. The

responding programs appeared to be representative of the field; there was no apparent geographical clustering and large and small programs were included, but no analysis of response bias was made. Extrapolations for nonresponding programs were made based on information included on web pages, including size of total enrollment and number of faculty. The 124 programs currently graduate approximately 4,500 master's and 150–300 doctoral students each year. Program size ranged from 250 enrolled master's students in residential and executive programs to two master's graduates per year. There were doctoral programs graduating a single candidate every other year to one program with 65 enrolled doctoral students graduating up to 15 in 1 year. These numbers should be considered a low estimate of the potential entrants into HSR, as many who work in the field enter via other programs and training. By combining the numbers of master's graduates from programs listed by Academy-Health (4,500) with a mid-range estimate of the doctoral graduates from those same programs (225), a mid-range estimate of the total annual production of HSR-related degrees is 4,725. However, there are additional programs whose master's and doctoral graduates will have completed a thesis or dissertation with a health services topic or focus and who will seek employment in HSR. This number is unknown but likely to be in the range of 300–500. Of the graduates of the HSR-related programs, a number will have not focused on HSR but may have majored or concentrated on a disciplinary track or in management or leadership. This might reduce the input to HSR by a factor of perhaps 10 percent. This would result in an estimated annual output of 5,000 persons with HSR training (a high estimate is 5,695; see note 1). This number does not include the postdoctoral trainees or a portion of the programs that train clinicians in HSR. Most of the latter earn master's degrees, usually the M.P.H., either as part of their clinical curriculum or in parallel with their clinical degree, perhaps adding an additional semester or year to that doctoral degree.

HSR can be considered part of the social and behavioral sciences. The total workforce in behavioral and social science was estimated by the National Academies to be 57,843 in 1997, having doubled in 20 years. The future of the workforce in behavioral and social science was, at that time, viewed as tenuous: "Federal support for graduate education in the behavioral and social sciences has followed the same pattern seen in the basic biomedical sciences: declining numbers of students supported by training grants and fellowships, and a steady increase in students working as research assistants" (Office of Scientific and Engineering Personnel 2000). It is not clear that this trend applies to HSR programs.

*Government Training Programs*

The Agency for Healthcare Research and Quality (AHRQ) allocated approximately U.S.\$18 million to training HSRs in 2006–2007, but this dropped to U.S.\$14.1 million in 2008. The most comprehensive programs for training health service researchers are the AHRQ institutional training grants (T-32s), of which there were 27 in mid-2006. These programs are usually affiliated with a separately funded HSR center or combination of centers. The programs most often include pre- and postdoctoral fellows (13 of the 27) with five focusing on predoctoral students and the balance on postdoctoral fellows. The AHRQ also funds programs to develop HSR infrastructure that also help support trainees. These emphasize the development of capacity in historically black or minority-focused institutions. AHRQ dissertation grant awards in HSR have supported approximately 65 doctoral students in 25 universities since its inception through 2007. These students often have received predoctoral fellowships in one of the institutional programs. The AHRQ Career Development Awards (KO2) include Independent Scientist Awards (18 listed, 8 completed) and the Mentored Clinical Scientist Awards (KO8, 59 listed, 12 completed); these develop principal investigators (PIs) in project-focused work.

*Academic Programs*

Academic training programs in HSR take many forms. Those established early were often doctoral programs in departments or schools that used another rubric than HSR (e.g., social medicine, population health, health services, and health policy). The first wave of organized HSR centers was funded in 1968 by the federal National Center for Health Services Research and Development in the Department of Health Education and Welfare (DHEW). These early HSR programs benefited from close relationships to degree-granting programs in universities and drew advanced graduate students from other departments or schools on the same or nearby campuses.

Doctoral training in the 1960s and 1970s was considered requisite for health services researchers and remains very important for the training of senior researchers and PIs. The core curriculum of most HSR programs at the doctoral level includes an orientation to research method and theories of knowledge generation; this is characteristic of most doctoral programs. HSR programs often include a focused course on the assessment of evidence in the scientific literature, meta-analysis, and comparative effectiveness reviews. Other common courses specific to HSR include one or more devoted to

quality and quality measurement. Also specific to HSR are courses that are devoted to data extraction and data management that often include substantial discussion of secondary datasets and administrative data in health care organizations. These are supplemented by courses that build quantitative analytical skills in specific disciplines, often economics or biostatistics, but curricula may also include courses that emphasize qualitative methods and skills. Strong HSR programs also orient students to the process of proposal writing and fund-raising and dissemination of research results.

There are freestanding master's degree programs in HSR in research universities and academic health centers that are not directly articulated with doctoral programs. One such program offers a Master of Science in Health Services Research, which is described as an interdisciplinary terminal degree: "... a research-oriented program with a concentration on economics and statistics, outcomes research, cost-effectiveness, and technology assessment. This program is designed to complement training in the medical and social sciences and prepare students for research careers in health services or health policy analysis."

More recently, master's degree programs have emerged that are specifically labeled "health services research" or that include the preparation of health services researchers in their mission statements. These have been organized to take advantage of the perceived growing demand for investigators and technicians. They are often housed in schools not traditionally associated with HSR, including schools of allied health and associated health professions. More common are programs in schools of public health and in programs associated with medical schools that prepare master's degree students for roles in research. Many of these are generalist in nature, while others are specific to the development of skills in clinical trials studies, for example, certificate in clinical trials management or in "research management." These courses reflect the growing demand for individuals who can support HSR projects as well as function in applied settings where data are used for decision making and evaluation.

There are master's and bachelor's programs in health services administration that provide students with analytical tools that can be used in HSR. The Association of University Programs in Health Administration (AUPHA) 2006 *Academic Program Survey* identified 128 total programs: 83 graduate and 45 undergraduate (AUPHA 2005). Those programs annually generate perhaps 300 graduates with substantial preparation for HSR (of a total of 6,149 in 2007).<sup>1</sup>

Programs at the doctoral and master's degree level also include "modules" and short courses that offer focused training in HSR, and these are often

available to nondegree students. Health care delivery systems or institutions also offer “on the job” training in research methods for practitioners and analysts to support clinically related research (Field, Tranquada, and Feasley 1995). Many professional societies associated with HSR offer short courses as part of their annual meetings or in special sessions held in the summer or between semesters. These are more often focused on specific methods or issues rather than an overall orientation to the field. There is a tradition of summer institutes in HSR methods offered by departments and programs of epidemiology, biostatistics, health policy, and other units in universities.

The relationship between epidemiology and HSR has become closer over the years with traditional public health-based departments of epidemiology now including “health services” as an emphasis area for master’s and doctoral students. Programs in preventive medicine often host departments and divisions that train HSRs. Recently, “population health” has become a term to describe an approach to the study of health and disease in groups that is more oriented to action or intervention and promotes research careers. These programs tend toward a health services orientation due to their applied emphasis.

There are joint “medical public health” programs that award an M.D./M.P.H. degree. In 2006, there were approximately 805 medical students enrolled in such programs (Barzansky and Etzel 2006). There are also informal arrangements that allow for an “extra year” in medical school, where the medical students take time to earn an M.P.H. from an associated program in the medical school or in another institution. The American Medical Student Association distributes an inventory of joint M.D./M.P.H. programs identifying 17 joint degree programs with a school of public health and five programs affiliated with a graduate program in community health/preventive medicine.

### *Postgraduate Programs for Clinicians*

An example of this type of program is the Robert Wood Johnson Clinical Scholars program that prepares physicians for careers in health policy and academic medicine. The programs include 2 years of core training in HSR, but graduates often move into leadership and teaching and not necessarily research. Through 2007, the program had produced 1,042 scholars in 14 separate programs that were funded at various times. It currently operates in four schools (UCLA, Michigan, Penn, and Yale), down from seven in 2002, with 68 trainees in the program, including 12 in an optional third year. The Johnson program, which includes trainees supported by the Veteran Administration and the American College of Surgeons, is representative of other, resident

focused of post-M.D. programs that may be sponsored by a clinical specialty or a health care delivery system for a limited number of clinician trainees.

An analysis published in 2007 suggests that the flow of clinical investigators for “patient-oriented” research has slowed to the degree that there is concern that there will not be sufficient trained researchers (Fang et al. 2007). A 2007 report from the Association of Academic Medical Centers shows high rates of turnover and attrition in the institutions that support these investigators and calls for attention and support from the National Institutes of Health (NIH) to reverse this trend. One implication of a shortage in the clinical research field is that more pressure will be placed on the pool of investigators to shift more into biomedical work and away from health services.

### *Clinical Discipline-Based Programs*

Clinicians from various health disciplines make up one of the largest single groups of HSR. Most come from medicine but there are sizeable groups from nursing, dentistry, and pharmacy with a small but growing group in what are called the “allied health” professions. In each of these professions there are options for students to enter a special track or curriculum that prepares them for a career or to participate in HSR. This option is not in all schools, but most of the major academic health centers offer some avenue into HSR, either as a certificate or a 1-year master’s degree curriculum. In postgraduate training in medicine there are established programs to train academic researchers with an emphasis on HSR. The same holds for nursing and dentistry with postdoctoral, National Research Service Award programs funded via the Institutional Research Training Grants (T32) mechanism of the NIH.

There are currently (2009) 28 T32 institutional training awards funded by the AHRQ. A 1995 study by the IOM in 1995 (Field, Tranquada, and Feasley 1995) focused on doctoral programs and fellowships in HSR and found that three-quarters of all trainees had earned a doctoral degree before their selection as fellows. Three-quarters of those had earned their doctorate in a “health science” (including health policy and HSR) field and there was an increasing number of females in training programs. Over three-quarters of the T32 (institutional training award) predoctoral trainees had earned their baccalaureate degrees in one of the sciences, with 38 percent in the social sciences, 19 percent in the health sciences, and 22 percent in other scientific fields, including the physical and mathematical sciences. At the postdoctoral level, T32 training has proven to be a mechanism that attracts clinicians into a research career. Of the 181 AHRQ postdoctoral trainees providing CVs to the

IOM study, two-thirds were originally trained in a clinical field. Data reported by the AHRQ and its training programs indicate that the number of physicians in postdoctoral NRSA training has fallen steadily between 1990 and 1997 while the number of mentored career development awards increased. However, the drop in the former was not matched by equal gains in the latter.

The National Institute of Nursing Research funds 23 T32 training programs that include many with substantial emphasis on health services. Similarly, the National Institute of Dental and Craniofacial Research (NIDCR) supports programs that may also include dental services research; of the 15 listed by the NIDCR in early 2009, five indicate an emphasis on “patient-oriented research,” “translational research,” “informatics,” or dental services. The growth of focused HSR in nursing was highlighted in an AHRQ-sponsored conference in 2005 (Jones and Mark 2005). Jones and Mark suggested that there was a general need for nurse-HSRs and an expansion of program to train nurses in HSR skills and competencies, but they did not attempt to measure the balance of need versus supply in the field nor estimate the numbers of nurse trainees in HSR.

Pharmacy has become an increasingly important component of health services delivery as pharmaceutical products have emerged as one of the most important mechanisms to improve health or cure disease. The growth of specific HSR-pharmacy-related centers (e.g., Pharmaceutical Outcomes Research and Policy Program, University of Wisconsin and similar programs at the University of Washington, University of Colorado, and University of North Carolina) has been substantial in recent years as the financing of pharmacy products and services has become progressively an issue in debates over financing health care (e.g., the expansion of Medicare Part D has resulted in many more funded projects examining pharmacy practice and the use of drugs in medical care).

There are academic programs that are specifically termed “health services research” in schools that have, in the past, trained primarily professionals in the “allied” health sciences—physical therapy, speech and language therapy, laboratory science, and imaging technologies. Allied health schools and colleges are often affiliated or associated with schools of medicine, dentistry or nursing, or include nursing within their organizational structure. For example, the University of Florida doctoral program in HSR is situated within the University’s College of Public Health and Health Professions, separate from its School of Medicine. The expansion of interest in HSR in clinical fields beyond medicine, dentistry, nursing, and pharmacy is likely to continue and contribute significant numbers of new HSRs over the coming years.

The Veterans' Administration (VA) includes a Health Services Research and Development Service (HSR&D) in its Office of Research and Development (ORD), which is active in supporting the work and training of health services researchers. The VA trains clinicians through its affiliated residencies in medicine and dentistry as well as in other clinical areas. The system also supports a Health Services Research and Development Career Development Program that has trained clinicians as well as academic researchers in the field. These programs often have robust research groups involved in work with their associated universities and centers for HSR. There is also a system of HSR centers in the VA; 15 centers of excellence, 7 Research Enhancement Award Programs (REAP), and 6 Targeted Research Enhancement Programs. The greatest area of emphasis on training the VA is through the Career Development program and the Research Career Scientist program. These provide protected research time for VA clinicians and nonclinicians who work on HSR projects. The Associate Investigator program provides opportunities for junior investigators to work on HSR&D research projects under the mentorship of an experienced PI. The REAPs target sites where the presence of a small number (but at least three) funded HSR&D investigators signals potential growth. REAP awards provide infrastructure support, including costs for some personnel, supplies and equipment, and for pilot projects. In addition, the Nursing Research Initiative (NRI) is another capacity-building program managed by HSR&D for all the services within ORD. The number of active trainees involved in VA programs is not known; however, the VA HSR&D program lists 2,311 individuals in its database of researchers or research staff; approximately 750 of those have an M.D. degree, 600 a Ph.D. or Dr.P.H., and 350 have a master's as their highest academic degree.

## DISCIPLINES AND HSR

The IOM listed a very wide range of disciplines that prepare HSRs:

... the majority of health services researchers come from such disciplines as biostatistics, clinical sciences, economics, epidemiology, political science, psychology, sociology, and statistics. Other disciplines that contribute to the field include such disparate areas as actuarial science, anthropology, decision theory, demography, engineering, ethics, finance, gerontology, geography, health education, history, law, marketing, medical informatics, nutrition, operations research, and pharmacy. (Thaul, Lohr, and Tranquada 1994)

These include focused health or health services programs within traditional academic departments in colleges and universities. There are specific examples of programs in HSR in departments of economics and closely related work within medical sociology and medical anthropology programs or departments. To capture a sense of the volume of training going forward in these places, we examined dissertation topics compiled by the University of Michigan in their ProQuest system using these disciplinary rubrics as search terms. In the 10-year period 1997–2007, 2,177 dissertations were completed with the term “health services” in the title and 327 using “health services” as a keyword in the ProQuest dissertation abstracts collection. ProQuest is an inventory and search system that is linked to the University of Michigan’s (UMI) collection of dissertations. This does not cleanly and exclusively identify the number of dissertations that relate to health services but provides a sense of the range of places and programs that support these doctoral students. For example, the search terms “Health” and “Costs” yielded 268 dissertation titles.

Training in economics has become the preparation for a plurality of social scientists who identify themselves as health services researchers by membership in AcademyHealth. There are approximately 350 economics Ph.D.s awarded each year (<http://www.econphd.net>) with an unknown proportion in health economics. There are over 55,000 dissertations included in the ProQuest system with a subject of “economics” and, of those, 820 with the term “health” in the title and 191 with the term “medical” in the title. The ProQuest dataset is not fully analyzable for more specific numbers and trends. However, it is likely that no more than 4–5 percent of dissertations in economics programs are focused on HSR each year—perhaps 15–20 in all. The ProQuest system would benefit from the use of a classification system for the dissertations that followed the work of the National Library of Medicine PubMed query guidance structure ([http://www.nlm.nih.gov/nichsr/hedges/HSR\\_queries\\_table.html](http://www.nlm.nih.gov/nichsr/hedges/HSR_queries_table.html)).

Sociologists make up a significant proportion of self-identified HSRs. However, as opposed to economics, there are clearer divisions within the discipline that tend to classify researchers as well as programs in their orientation toward health services. The discipline of sociology includes a specialty specific to health care, medical sociology, and some of the most important contributions to understanding the delivery of health care have come out of that focused part of sociology. The other important subdiscipline is organizational sociology that includes a robust collection of researchers who conduct investigations into the structure and functioning of health care institutions and practitioners. There were only 12 dissertations in the UMI ProQuest files

that combined sociology as the subject with “health services research”; 23 combining “costs” and “medicine” but 2,682 with either “medicine” or “medical” or “physician” in the title or abstract. The number of completed “core” HSR-focused dissertations in sociology is likely to range from 300 to 500. The themes of many of the dissertations include the preparation of practitioners, communications and perceptions in health care, and cross-cultural or cross-national comparisons of behaviors and organization of services.

Other disciplines contribute significant numbers of HSRs, but it is rare to see a specific “track” in health services in programs in demography, anthropology, operations research, statistics, management, organizational, political science and/or public policy and policy studies, information science or informatics, and geography—all of which touch on HSR and are represented in the background and training of prominent current investigators.

## CONCLUSIONS: FUTURE CHALLENGES FOR TRAINING IN HSR

The number, size, and complexity of datasets that are available for HSR are likely to increase exponentially and create a need for more sophisticated data management and analysis skills for individuals and teams involved in HSR. The ability to competently and effectively handle very large and complex data will become a necessary skill or component for projects. Training in data management is often left to the “apprenticeship” or dissertation portions of curricula in HSR and appears to be haphazard in its application. There appear to be few dedicated courses or curricular elements in data management for the master’s and doctoral programs but examples do exist, for example, the National Association of Health Data Organizations offers online resources for data standards, and there are learning modules from the NLM’s “Introduction to Health Services Research” as part of the National Information Center on Health Services Research and Health Care Technology website (<http://www.nlm.nih.gov/nichsr>). The methodologies required in HSR have made it necessary for the master’s-prepared analyst and manager to master relatively complex analysis skills. This puts pressure on the new entrants to the field to understand an ever-widening array of statistical and analytical techniques as well as learning how to make the results of those analyses understandable by those who must apply the lessons.

The development of “translational” research mechanisms that push research results into the field has long been seen as a weakness in research and development in health services (Zerhouni and Alving 2006; Zerhouni 2007). In 2008, the emerging concern in research and development in health care and HSR is for rapid-cycle applications. This tendency is reflected in the Clinical and Translational Science Awards (CTSA) grant program that the NIH is now using to fund basic research in large academic health centers. This funding mechanism is intended to “re-engineer the clinical research enterprise” to “spur innovation, integration, inclusion and dissemination” (NIH Press release; October 3, 2006). These translation programs are intended to move knowledge into practice at a much faster rate. HSR is one component of what NIH refers to as “type II translational research,” in which research is moved from the bedside to the practice and the community. The response from the HSR field has been to accept but not necessarily embrace this new emphasis. The diffusion of innovations and discoveries into practice requires understanding of the operational processes of health care—something that HSR is equipped to do. HSR training programs can contribute to translational research with modifications to curricula, and there are conscious efforts to do so in the funded CTSA programs.

The field of HSR has probably been affected more than the clinical world by the recent tightening of rules concerning access to health-related data under the Health Insurance Portability and Accessibility Act (HIPAA) and rules and guidelines covering human subjects research. Efforts to protect confidentiality and to protect individuals and groups from harm in research projects have produced substantial bureaucratic requirements that affect the ability of programs and projects to gather and analyze data. These burdens are usually manageable for larger projects but may thwart initiation of projects by smaller research units because of added costs or the inability to employ students on projects (Shen et al. 2006). A study reported in *Science* indicated that, in epidemiology, the HIPAA requirements have increased the costs of research, caused delays in some projects, and kept investigators from undertaking projects due to restrictions on certain data elements (Kaiser 2007).

These challenges, expanding data availability and complexity, the need to translate research into practice more quickly, the pressure to maintain individuals’ privacy while working with vast, interconnected datasets, and the continuing demand to cut costs while improving quality ensure that HSR will be an important resource for the U.S. health care system well into the future. Training and educational systems and programs have, apparently, been able to meet the needs for skilled analysts and researchers to cope with these

problems to the extent that that research has been funded. A major acceleration of that funding may reveal a gap between training capacity and demand, and large economic stimulus packages passed in Congress that push funding into research may do just that.

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NOTE

1. This is based on an estimate of one-half of the annual number of graduates of master’s programs in institutions that also have doctoral programs in HSR or associated fields and topics. This would comprise 26 programs with an average of 24 total students, and thus  $26 \times 12 = 300$ .

Estimate of Annual Number of Graduates Prepared in Health Services Research

	<i>Low Estimate</i>	<i>High Estimate</i>
M.D./M.P.H.	500	800
M.P.H.*	500	750
M.S.P.H., M.H.A., M.S., M.A., M.H.S.A.	2,750	3,750
Doctoral programs	150	240
Fellowships	75	150
Total	3,975	5,695

\*There are 75 M.P.H. programs accredited by CEPH and 39 U.S. schools of public health that offer M.P.H. degrees.

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